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10/673,807	09/29/2003	Tae-Kyung Kim	02-ASD-272 (EM)	2212
200	7590	07/19/2006	EXAMINER	
EATON CORPORATION EATON CENTER 1111 SUPERIOR AVENUE CLEVELAND, OH 44114			ROSSI, JESSICA	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Advisory Action  
Before the Filing of an Appeal Brief**

Application No.

10/673,807

Applicant(s)

KIM, TAE-KYUNG

Examiner

Jessica L. Rossi

Art Unit

1733

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 10 July 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.  
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: \_\_\_\_\_.  
Claim(s) objected to: \_\_\_\_\_.  
Claim(s) rejected: \_\_\_\_\_.  
Claim(s) withdrawn from consideration: \_\_\_\_\_.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: see attached sheets.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 7/10/06 have been fully considered but they are not persuasive.
2. On p. 4 of the remarks, Applicant argues there is no suggestion to combine the Admitted Prior Art (APA) with Muller because, contrary to the Examiner's assertion, the adhesive capsule in Muller is not squeezed with the structural members like the claimed invention.

The examiner respectfully points out that it was never asserted by the Examiner that the adhesive capsule of Muller is squeezed with the structural members like the claimed invention (see 1<sup>st</sup> paragraph on p. 3 of final rejection). As set forth clearly in the final rejection, the examiner was only relying on Muller for its general teaching of forming a bond/seal between a gasket and another surface by disposing a capsule of adhesive/sealant on the gasket and squeezing the capsule by pressing the gasket and the surface together to dispense the adhesive/sealant from the capsule (Figure 3 of Muller teaches capsule 17 disposed within a recess formed in gasket 3 and pressing gasket 3 towards surface 1 to rupture the capsule and dispense the adhesive/sealant).

3. Applicant then argues that Muller requires a portion of the capsule to rest against a rigid surface, such as cylinder block 1 in Figure 3, so that the rigid surface can apply enough resistance against the load to break the capsule and therefore one of ordinary skill in the art would not have incorporated any kind of adhesive capsule shown in Muller between a plurality of gaskets like the claimed method because, as is known in the art, gaskets are made of resilient material, and from Muller's teachings, one of ordinary skill would have believed that placing the

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capsule between a plurality of gaskets like the claimed invention would provide insufficient force to break the capsule; thus, nothing in the combination of the APA and Muller suggest placing a capsule between adjoining gaskets.

First, the examiner would like to point out that the present claims only state that the capsule is squeezed with the structural members, not the gaskets, and therefore this argument is not commensurate with the scope of the claimed invention. Regardless, Applicant's position that one having ordinary skill in the art would believe gaskets would provide insufficient force to break the capsule is completely unfounded given the fact that one having ordinary skill in the art would have readily appreciated that gaskets, while being resilient, can require loads of up to 1000 psi before exhibiting compressibility and can be made from a variety of materials such as plastics and metal (see US 3767211 to Amphlett, of record, at column 2, lines 32-40).

Second, as stated above, the examiner was only relying on Muller for its general teaching of using a capsule to dispense a predetermined amount of sealant/adhesive between a gasket and another surface by rupturing the capsule because it provides an obvious advantage over other sealant/adhesive delivery systems, such as machine-injected sealants/adhesives, that are messier, more costly and more time consuming, as set forth by the examiner in paragraph 1 on p. 3 of the final rejection.

4. On p. 4-5 of the remarks, Applicant argues that nothing in Muller suggests forming the capsule so that it contains sufficient viscous sealant to seal a pocket between gaskets because such a capsule would be larger than any capsule contemplated by Muller since all the embodiments shown in Muller show a capsule that holds just enough adhesive to fill a very

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limited, localized space, not a larger volume pocket formed by adjoining gaskets between structural members.

The examiner points out that the present claims say nothing about the size of the pocket and therefore this argument is not commensurate with the scope of the claimed invention.

Regardless, it would be obvious to one having ordinary skill in the art to use a capsule that is large enough to hold the amount of sealant/adhesive necessary to fill the pocket into which the capsule is placed (see US 3756635 to Beers, of record, at column 3, lines 45-49 and US 4514125 to Stol, of record, at column 1, lines 63-65).

5. On p. 5 of the remarks, Applicant argues that the liquid in the cap of Muller is only a thin adhesive to anchor the gasket 3 and not a viscous sealant.

First, the examiner respectfully points out that Muller says nothing about the adhesive being thin and therefore this is mere speculation on Applicant's part. Second, although Muller does not use the same terminology as Applicant (does not refer to adhesive as sealant), the adhesive of Muller clearly reads on Applicant's claimed 'sealant' when giving 'sealant' its broadest and most reasonable interpretation. Furthermore, one having ordinary skill in the art would have readily appreciated it being understood in the art that sealants are adhesives. Regardless, the examiner would still equate the adhesive of Muller to Applicant's claimed 'sealant' given that Applicant has not set forth any limitations that differentiate the claimed sealant from the adhesive of Muller.

As for the sealant being viscous, the examiner would like to point out that a viscous material is one having a viscosity and since all sealants/adhesives have a viscosity, they all can be classified as viscous, regardless of the magnitude of their viscosity. Regardless, the examiner

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would like to point out that the APA teaches a viscous sealant and therefore the examiner was only modifying the APA so as to render it obvious to use this viscous sealant in the form of a rupturable capsule based on the teaching of Muller.

6. On p. 6 of the remarks, Applicant argues that Beers does not show any capsule filled with viscous sealant because the adhesive of Beers must be thin to flow past an interference fit. Applicant also argues that Stol teaches anchoring a fastener and therefore the adhesive is not a viscous sealant because it must flow freely around the fastener. Applicant also argues that Abraham addresses the same problem as Stohl and also requires the adhesive (not sealant) to be thin enough to flow around the fastener.

As for Applicant's arguments regarding a sealant that is viscous, please refer to paragraph 5 above. More importantly, the examiner would like to point out that the teachings of Beers, Stol and Abraham were only relied on for their general teaching of forming a bond/seal between two members by disposing a capsule of adhesive/sealant on one of the members and squeezing the capsule by pressing the members together to dispense the adhesive/sealant from the capsule because it provides an obvious advantage over other sealant/adhesive delivery systems, such as machine-injected sealants/adhesives, that are messier, more costly and more time consuming (Beers at column 1, lines 44-55 and column 6, line 68 – column 7, line 1; Stol at column 1, lines 37-65), as set forth in the 2<sup>nd</sup> paragraph on p. 5 of the final rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **571-272-1223**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JESSICA ROSSI  
PRIMARY EXAMINER  
*Jessica Rossi*

PTO 06-3890

CY=DE DATE=19830929 KIND=A1  
[PN=32 10 377]

METHOD FOR POSITIONING A CYLINDER HEAD GASKET, DEVICE FOR IMPLEMENTING  
THE METHOD AND CYLINDER HEAD GASKET FOR USE IN THE METHOD  
[VERFAHREN ZUR POSITIONIERUNG EINER ZYLINDERKOPFDICHTUNG, EINRICHTUNG  
ZUR DURCHFUEHRUNG DES VERFAHRENS UND ZYLINDERKOPFDICHTUNG ZUR  
VERWENDUNG BEI DEM VERFAHREN]

HELMUT MUELLER, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE  
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INVENTOR	(72):	Helmut Mueller, Bodo Wallenbach, and Peter Thauer
APPLICANT	(71):	Volkswagenwerk AG
TITLE	(54):	METHOD FOR POSITIONING A CYLINDER HEAD GASKET, DEVICE FOR IMPLEMENTING THE METHOD, AND CYLINDER HEAD GASKET FOR USE IN THE METHOD
FOREIGN TITLE	[54A]:	VERFAHREN ZUR POSITIONIERUNG EINER ZYLINDERKOPFDICHTUNG, EINRICHTUNG ZUR DURCHFUEHRUNG DES VERFAHRENS UND ZYLINDERKOPFDICHTUNG ZUR VERWENDUNG BEI DEM VERFAHREN

1. A method for positioning a cylinder head gasket, that is placed between a cylinder head and a cylinder block, containing cylinder bores, of a multicylinder reciprocating piston internal combustion engine and which has cylinder through holes associated with the individual cylinder bores, wherein the cylinder head gasket (3) first is placed on the cylinder block (1), then is centered by means of a centering device (6, 7) aligning the cylinder through holes (4) of the gasket with the cylinder bores (2) of the cylinder block, and finally is held in the centered position on the cylinder block at least until the cylinder head is fastened to the cylinder block.

2. The method according to Claim 1, wherein the gasket (3) is fastened to the cylinder block (1) by using an adhesive.

3. The method according to Claim 2, wherein the adhesive is applied by breaking an adhesive capsule (10) mounted on the gasket (3).

4. The method according to Claim 1, wherein the gasket is fastened to the cylinder block by mechanical connecting elements.

5. The method according to Claim 4, wherein the connecting elements are arranged outside the sealing surface lying between the cylinder block and the cylinder head.

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6. A device for performing the method according to one of the Claims 1 to 3, wherein a centering device (6, 7) that has centering bolts (7) engaging through the cylinder through holes (4) of the

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\*Numbers in the margin indicate pagination in the foreign text.

gasket (3) in at least two cylinder bores (2) of the cylinder block (1).

7. The device according to Claim 6, wherein the centering bolts (7) are made conical.

8. The device according to one of Claims 6 or 7, wherein stamps (11) capable of being operated for centering the gasket (3) for breaking adhesive capsules (10) mounted on the gasket are provided.

9. A cylinder head gasket for use in the case of the method according to one of Claims 1 to 3, wherein the gasket (3) has adhesion points (10) on at least two widely separated points on the side turned toward the cylinder block (1), that can be utilized only after the centering of the gasket on the cylinder block.

10. The cylinder head gasket according to Claim 9, wherein the gasket (3) has recesses (8, 16, 20, 22) for holding breakable capsules (10, 14, 17, 21, 26) filled with glue on the side turned toward the cylinder (1).

11. The cylinder head gasket according to Claim 9, wherein the gasket has adhesive application points covered with removable coatings on the side turned toward the cylinder block.

METHOD FOR POSITIONING A CYLINDER HEAD GASKET, DEVICE FOR  
IMPLEMENTING THE METHOD, AND CYLINDER HEAD GASKET FOR USE  
IN THE METHOD /3

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The invention concerns a method for positioning a cylinder head gasket according to the preamble of Patent Claim 1, a device for implementing the method, and a cylinder head suited for use in this method.

In particular, in the case of high-compression reciprocating piston internal combustion engines, such as high-compression diesel internal combustion engines or Otto internal combustion engines, in the case of which a compact combustion chamber located in the cylinder or in the cylinder head is desired, there are relatively narrow gap spaces between the cylinder head and the piston in the upper dead point, which leads to the fact that the piston in the upper dead point projects over the sealing surface of the cylinder block into the gasket area. Since these gap spaces act as dead or damage areas, it is sought to limit their size. In this case their size is codetermined by the cylinder through holes provided on the cylinder head gasket, the diameter of which holes again are determined by the tolerances to be maintained at the time of assembling the motors. A very precise centering of the cylinder head gaskets to the cylinder bores of the cylinder head in this case could result in a significant reduction of the areas of damage. However, centering of the gasket via the cylinder head fastening screws or also via special centering pins has not been satisfactory up to now.

Therefore the basic object of the invention is to propose a /4 method for the most precise possible positioning, respectively centering, of the cylinder head gasket on the cylinder block, that makes a decisive reduction of the areas of damage by narrowing the tolerances to be provided for the cylinder through holes and the also is suitable for automatic assembly of the engines.

This object is achieved according to the characterizing clause of Patent Claim 1. Therefore, according to the invention, the cylinder head gasket should be directly centered with respect to the cylinder bores of the cylinder block, which offers the possibility of reducing the tolerances. However, in order to be able to keep this centered position secured for the assembly of the cylinder head, the cylinder head gasket is to be attached in the centered position on the cylinder block. Adhesives or also even mechanical fastenings are offered for this attachment.

A device for performing the method should provide a centering device that has centering bolts that are advantageously made conical, engaging in at least two cylinder bores of the cylinder block. If capsules filled with adhesives are provided on the gasket, the device also is to have stamps that can be used for breaking these capsules after the centering of the gasket.

Finally, the invention proposes a cylinder head gasket for used in the method according to the invention, in which the gasket has adhesion points that are used only after the centering of the gasket, at at least two opposite points on the side turned toward the cylinder block. In this case, the adhesion point can be formed by a capsule filled with an adhesive, which capsule is located in a recess of the gasket. According to another proposal the adhesion point also can be formed by a contact adhesive applied to the side of the gasket turned toward the cylinder block, which adhesive is covered by a removable covering.

Useful configurations of the invention follow from the remaining subclaims.

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The drawing shows partially schematic representations of specific embodiments of the invention, that are explained in greater detail below. Here

Fig. 1 shows the process of centering a cylinder head gasket lying on a cylinder block according to the invention,

Figs. 2 - 5 show different arrangements for applying an adhesive that fastens the cylinder gasket to the cylinder block.

In Fig. 1 of the drawing the cylinder block of a multicylinder reciprocating piston combustion engine is indicated as 1 and a part of the cylinder bores of this cylinder block is indicated as 2. 3 represents a cylinder head gasket, that is provided for sealing the sealing surface formed between the cylinder block and the cylinder head attached to the latter, not shown here, the sealing surface having cylinder through holes 4 associated with each cylinder bore 2 of the cylinder block 1. Metal borders 5 known per se are provided on the cylinder head gasket 3 on the edge of these cylinders through holes.

In the drawing, the number 6 indicates a holding plate for receiving centering bolts 7 that are adjustable in the direction of the cylinder axis, which bolts are conically pointed on their ends penetrating into the cylinder bores 2 of the cylinder block 1. At least two of these centering bolts 7, that are associated with two cylinder bores of the cylinder block, for example the first and fourth

cylinders of a four-cylinder reciprocating piston combustion engine, are provided.

The centering of the cylinder head gasket 3 takes place now only in the way that first the gasket is placed on the cylinder block 1 in approximately correct position and that finally the holding plate having the adjustable centering bolts 7 is lowered onto the gasket, and that the gasket is held loosely. Then the centering bolts 7 are moved in the direction to the cylinder bolts, gripping them by the /6 cylinder through openings 4 of the cylinder head gasket 3 and centering the gasket with advancing penetration of the centering bolts 7 into the cylinder bores 2 with respect to these bores.

In the centered position of the cylinder head gasket 3 the latter is now fastened to the cylinder block 1 at least until the cylinder head to be fastened on the cylinder block is mounted. The fastening of the cylinder head gasket 3 now can take place in different ways, for example by mechanical means, such as cotter pins, clamps, dowel pins, and the like, or also by gluing, and either inside or outside of the sealing surface formed between the cylinder block and the cylinder head. In this case it is necessary to take care that the adhesive acts only after the cylinder head gasket is centered and attached to the cylinder block. For example, this can take place in the way that microcapsules filled with adhesive, that are broken after the final positioning and centering of the gasket, for example by mechanical means, at different points on the gasket, separated from each other as widely as possible.

In the case of the embodiment according to Fig. 1, the gasket has, for example, through holes 8, into which a plug-like cover plate 9 with a concave recess directed toward the sealing surface 13 of the cylinder block 1 is attached for receiving an adhesive capsule 10. In this case, the cover plate is to be elastically or plastically deformable, so that the adhesive capsule 10 can be broken by means of a stamp 11 guided in a cylindrical bore 12 of the holding plate 6, when the stamp is pushed down the cover plate 9 is pushed in and the capsule 10 is let to burst open.

Figures 2 to 5 show different further embodiments for arranging adhesive-filled microcapsules of this kind, the adhesive having to suited for securely attaching the cylinder head gasket 3 in general provided with a silicon coating on the sealing surface 13 of the cylinder block 1, frequently wetted with oil during the assembly process. /7

Thus, Fig. 2 shows an embodiment in which a flat cover plate 13, under which an approximately cylindrical adhesive capsule 14 is located, in a through bore 8' of the gasket 3. On the side turned toward the sealing surface 13 of the cylinder block 1, another circular recess 15, made by pressing, that acts as a relieving area for the volume compression taking place at the time of loading the cover plate 9' by the stamp 11, is provided on the gasket 3.

In the case of the embodiment according to Fig. 3, an adhesive microcapsule designated with 17 is held directly in a concave recess 16 made on the side of the gasket turned toward the cylinder block 1.



In this case, the capsule 17 is broken by loading the point of the gasket 3 lying over this capsule.

Fig. 4 shows an embodiment in which a ring-shaped adhesive capsule 21 is provided in a recess 20 of gasket 3 formed by pressure, in particular in the area of a through hole 18 of the gasket, that, for example, makes the connection of a coolant line 19, provided in the cylinder block 1, with a line located in the cylinder block not shown here. After the adhesive capsule is broken open, the cylinder head gasket 3 is glued with the cylinder block 1, at the same time a certain sealing against the coolant liquid flowing through the line 19 and the through opening 18 being obtained.

Finally, Fig. 5 shows an embodiment in which an adhesive capsule designated as 26 is located in a through hole 22 of the gasket 3 under a cover element 23 sealing this through hole. The cover element 23 has a ring flange 24, that is held in a circular recess 25 of the gasket 3. The cover element should be deformable into the mold 23' shown in Fig. 5 on the right side for the purpose of breaking the capsule 26 by a stamp. In this case, it is also shown that the /8 adhesive wets practically the entire outer surface of the through hole 22 of the gasket 3 and the circular surface of the sealing surface 13 of the cylinder block 1, lying under this through hole, and thus ensures a satisfactory attachment of the gasket.

As was already mentioned above, the adhesive capsules can be located within the actual sealing surface formed between the cylinder

head and the cylinder block, or also outside the same, for example on special eyes provided on the cylinder block. Instead of the adhesive capsules, that must be broken open in order to make the connection after attachment of the gasket, it is also possible to use contact adhesive applications provided on the gasket 3, that are covered by removable coatings, for example made of silicon paper, during the attachment process, and which have to be removed after the final centering of the gasket. In this case, there is the difficulty of possibly having to lift the gasket briefly once more after centering it, in order to be able to reliably remove the covering.

As was indicated above, mechanical attaching or holding means also can be used in order to fasten the gasket 3 in its centered state on the cylinder block. It is advantageous for this to take place outside the actual sealing surface, for example on special eyes provided on the cylinder block.

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